

BOARD OF ENVIRONMENTAL REVIEW
AGENDA ITEM
EXECUTIVE SUMMARY FOR INITIATING RULEMAKING

Agenda # III.A. 1. Agenda

Item Summary

The department requests that the Board approve its proposal to initiate rulemaking to adopt New Rules I through IX pertaining to new classifications and standards for ephemeral streams, seasonal and semi-permanent lakes, and ponds and ditches; New Rule X pertaining to nutrient and standing crop standards for portions of the Clark Fork River; and definitions to clarify terms used in the new rules.

List of Affected Rules

ARM 17.30.602 - ARM 17.30.619

Affected Parties Summary

The proposed new rules could affect persons that will be renewing or obtaining a new MPDES permit that discharges to a water body that is re-classified under one of the proposed new classifications or discharges to portions of the Clark Fork River.

The proposed new classifications have associated water quality standards that are less stringent than existing standards. However, existing uses and downstream uses would be protected.

The proposed nutrient and standing crop standards for portions of the Clark Fork River may require more stringent MPDES effluent limits because in portions of the river nutrient levels exceed the proposed standards. Because numeric nutrient standards did not exist at the time the permits were written the effect to specific dischargers is not known.

Scope of Proposed Proceeding

The Department requests that the Board initiate rulemaking to adopt New Rules I through X, amend ARM 17.30.602 and ARM 17.30.619, and assign a hearing officer to preside over a public hearing.

Background

I. New Rules I through IX.

The current surface water classification system (ARM 17.30.607-614) assigns beneficial uses on a watershed basis with some specific exceptions. In general, individual streams are not identified or assigned specific uses and all waterbodies are presumed to be of a sufficient quality to meet their classification and associated standards. The system works well for perennial streams. However, ephemeral streams, ditches and seasonal and semi-permanent lakes can not be presumed to meet all designated uses of the watershed classifications. By their very nature these waterbodies can support a limited number of uses and then only when they have water. The existing water quality standards may be too stringent for some streams, lakes or ponds.

WQA section 75-5-301(1) directs the Board to establish a classification system for streams with sporadic flow. The proposed classes and standards address this requirement.

Many small communities in Montana treat their wastewater using lagoon systems, which discharge to ephemeral streams or ditches. In some cases the discharge is the only source of water in the channel.

A preliminary review of Montana Pollutant Discharge Elimination System (MPDES) permits indicates that at least 25 communities have lagoon systems that discharge to small streams or ditches. The communities typically have populations less than 2000 with many less than 500. Most of the discharges are less than 0.5 cubic feet per second (cfs) to receiving waters of 0-5 cfs. An in-depth review will most probably find many additional situations across the state.

Lagoon wastewater treatment systems are very popular with small communities because they are much less expensive to construct and maintain than an equivalent mechanical treatment plant. Lagoons are capable of treating domestic wastes to a similar level as a complex mechanical plant but it is extremely difficult, if not impossible, for a lagoon system to convert ammonia to a different form of nitrogen, especially during cold weather. The cost estimates to upgrade a lagoon system to meet ammonia standards in the receiving water range from 0.25 to 4 million dollars. Options that may be considered include piping the effluent to a larger receiving stream (lower cost), holding ponds and summer land application (medium cost) or construction of a mechanical plant with ammonia removal (high cost). Along with higher capital expenses, ammonia removal systems cost more to operate and a fulltime, more highly-trained certified operator would be needed.

Prior to receiving a wastewater discharge, the lack of water in these small streams severely limited the potential for an aquatic life community to develop, and the aquatic life communities that have developed in these waterbodies have adapted to the existing water quality. It is not reasonable to expect ephemeral waterbodies, ditches or temporary and semi-permanent lakes and ponds to support all the uses and standards of perennial waterbodies in the region.

The classes and associated standards proposed acknowledge that some uses can not be supported. In fact, aquatic life other than fish (e.g., amphibians) and wildlife uses of ephemeral streams or agricultural use of ditches may be the principle uses supported by these waterbodies. Ditches that were constructed to supply irrigation water or drain high groundwater can not develop an aquatic life assemblage that resembles a natural stream. Fluctuating flows, including dry periods, mechanical and pesticide "ditch cleaning" and the nearly complete lack of suitable hydro-geomorphologic conditions allow for a very limited, if any, aquatic life community. Certainly conditions do not resemble those of a perennial stream in the region.

Seasonal and semi-permanent lakes and ponds are unique. They are usually isolated from stream channels and are shallow without a defined outlet or inlet. The regional groundwater table is nearly always below the bottom of the lake or pond. Evaporation is probably the major mechanism for water loss, with some water infiltrating into the ground, albeit at a very slow rate. Aquatic life that has developed in these waterbodies have life stages resistant to prolonged periods of desiccation and changing salinity or are able to leave the waterbody. During portions of the year these water bodies are important sources of water for wildlife and possibly livestock and may also be critical habitat for amphibians and reptiles.

The proposed classifications and standards contain:

- Two ephemeral stream classes (E-1 and E-2);
- Two ditch classes (D-1 and D-2);
- Three seasonal or semi-permanent lake and pond classes (E-3, E-4 and E-5); and
- One low or sporadic flow class (F-1).

Prior to reclassifying a specific water body under a classification that removes a designated use, an analysis of the water body's existing uses must be completed. This analysis is called a "use attainability analysis" (UAA). A use attainability analysis is a scientific assessment and analysis of the factors affecting the attainment of a use. Information that may be used includes chemical, physical and biological data, as well as photo documentation and comparison to reference conditions. The information collected must be of sufficient detail to accurately portray the level and potential level of use support by a waterbody. The UAA should consider the requirements in CFR 131.10 et seq. The analysis can range from a simple site visit with photo documentation through an extensive biological, physical and chemical study. The UAA is required by the EPA before it can approve a reclassification that lowers water quality standards or removes a designated use.

EPHEMERAL STREAMS

The specific water quality standards and classifications in ARM 17.30.620-629, the surface water quality standards, do not apply to ephemeral streams. They are only protected by the prohibitions in the ARM (17.30.637(6)). The proposed ephemeral stream classes are E-1 (streams) and E-2 (flow-augmented ephemeral streams). The new classes

acknowledge that these waterbodies are not able to support all uses because they may lack water, or they may not meet numeric standards because of natural conditions (e.g., spring or wet weather runoff) or concentration by evaporation.

Because of the low probability that fish and associated aquatic life will be present, the chronic aquatic life standards will not apply to ephemeral streams. The periodic presence of water in ephemeral streams is not consistent with the assumptions used to develop the human health standards.

Human health criteria are risk-based and the EPA developed the criteria using extensive research of dose response. The data are then used to develop a reference dose based on the assumption that a 70 kg person consumes 2 liters of water for 70 years and with an increased health risk of 1:100,000. Applying standards developed in this manner is not appropriate for ephemeral streams. However, human health standards for carcinogens and parameters with a bioconcentration factor greater than 300 in WQB-7 will apply to protect against the potential cumulative and long-term effects of these parameters.

Ephemeral streams that have flows augmented by permitted discharges remain ephemeral even though water may be present much or all of the year. These streams do not have a local groundwater table that contributes to stream flow (i.e., it is always below the streambed) and they continue to receive runoff water from storm events and snowmelt. These streams may develop an aquatic life community that is uniquely suited to the site-specific conditions. The type of community (described by species composition and abundance or other metrics) is dependent upon the duration, quantity and quality of the discharge and natural flow events. The chronic aquatic life standards will not apply to these streams because the natural seasonal flows are not able to support aquatic life and the augmenting flows are likely to be variable. The acute aquatic life standards should apply in order to allow an aquatic life community, although limited, to develop during periods when water is present, with the exception that ammonia standards will not apply.

Justification for excepting ammonia from chronic and acute toxicity standards is because ammonia is not a "conservative parameter." Ammonia readily transforms through chemical and biological processes into nitrite, nitrate and nitrogen gas or it may volatilize into the atmosphere. The rate of each process varies with temperature, pH, turbulence and biologic activity. Ammonia is an important plant nutrient and can be rapidly taken up by aquatic plants.

Conservative parameters, for example copper, once introduced into a waterbody remain in the water column and, essentially, are not used in biologic processes like nutrients or dissolved oxygen. Conservative parameters may form precipitates or complexes with organic materials in the water column or sediment that may reduce the parameter's concentration in the water column but the precipitates or complexes may be re-suspended or re-dissolve and continue to be biologically active.

DITCHES

Water in ditches that is not "used up" is defined to be a state water (75-5-301(29) MCA). Unlike ephemeral streams, ditches are not excluded from any portion of the surface water quality standards. As a result, ditches have the same designated uses and standards as streams in their respective watershed.

However, ditches are constructed for a specific purpose or use, such as crop irrigation. Nearly all of these ditches have some type of flow control structure along its length or at least at an upstream diversion structure. Many ditches, especially large supply ditches, are lined to stop leakage and receive some type of routine maintenance. The maintenance may include application of herbicides or mechanical removal of trees and bushes and sediment removal. Routine maintenance severely limits the potential for aquatic life communities to develop. The amount of water in the ditch also varies often, including dry periods, which effectively removes all uses of the water.

The classic irrigation ditch (D-1) does not have water for much of the year and ditch maintenance severely reduces the opportunity to develop an aquatic life community. However when water is present there is an opportunity for incidental recreational use, secondary contact recreation, which should be protected by fecal coliform standards.

Other ditches contain varying amounts of groundwater in addition to diverted stream water (D-2). These ditches may have an opportunity to develop a limited aquatic life community and like ephemeral streams that receive continuous discharges should receive protection from toxic conditions. Except for the reasons stated above the ammonia standards will not apply.

Ditches that have water throughout the year may be important for fish and other aquatic life. These waters should receive the same protection of uses as perennial streams in the region and do not have a special classification.

SEASONAL AND SEMI-PERMANENT LAKES AND PONDS

Temporary ponds and lakes (E-3) and semi-permanent lakes and ponds where the electrical conductivity (EC) exceeding 7,000 mS/cm (E-5) are unlikely to develop a persistent aquatic life community or the community that develops, which may be unique and locally important, (e.g., saline lakes) has adapted to those conditions. The natural water quality in many of these situations exceeds the aquatic life criteria that were developed using, predominately, species characteristic of non-saline conditions. Therefore, the aquatic life chronic and acute standards and the human health standards will not apply. Because of the potential for concentration and accumulation of certain parameters, the human health standards for carcinogens and parameters with a bioconcentration factor greater than 300 in WQB-7 should apply.

Semi-permanent lakes and ponds where the EC remains less than 7,000 mS/cm have the potential to develop a diverse aquatic community and may be critical to amphibians, reptiles, waterfowl and wildlife. The aquatic and semi-aquatic species that depend upon these waterbodies have adapted with short life cycles, the ability to survive extended periods of desiccation or they are able to move to other locations when necessary. In order to protect these species the chronic and acute toxicity aquatic life standards should apply to these lakes and ponds. The human health criteria need not apply for the reasons described above. Similar to the reasons presented for the other classifications, the human health standards for carcinogens and parameters with a bioconcentration factor in WQB-7 greater than 300 should apply.

STREAMS WITH LOW OR SPORADIC FLOW

Streams with low or sporadic flow (F-1) often are not able to support fish because of natural hydro-geomorphic and hydrologic conditions. These streams have few, if any, tributaries. The water from a permitted discharge to such a stream will determine its final water quality and the potential aquatic life community, wildlife and recreational uses are similar to the proposed E-2 classification (ephemeral streams augmented by continuous discharges) and should receive the same level of protection.

II. New Rule X.

Since 1984, when a comprehensive study of the Clark Fork River basin was initiated by then Governor Ted Schwinden, algae and nutrient problems in the Clark Fork River have moved to the top of the basin's priority list (Clark Fork Basin Project Status Report, 1988). Concentrations of Phosphorus (P) and Nitrogen (N) in the Clark Fork River have resulted in dense mats of filamentous algae (mainly *Cladophora*) above Missoula and heavy growths of diatom algae below Missoula. There is concern that existing N and P concentrations and the resultant algae growth are impairing beneficial uses in Clark Fork River segments and, without doubt, there are many locations along the river where excess algae growth is a major aesthetic problem. Further, nutrients and algae problems were ranked as the major water quality issue jointly affecting Montana and Idaho.

The Tri-State Water Quality Council was formed in 1993 to oversee a coordinated program investigating nutrient sources and sinks in the Clark Fork-Pend Oreille basin of Montana, Idaho and Washington. Through efforts supported in part by the Council, a Voluntary Nutrient Reduction Program (VNRP) was signed in August, 1998, by four major point source nutrient contributors along the Clark Fork River (Butte-Silverbow, the City of Deer Lodge, the City of Missoula and Missoula City-County Health Department, and Stone Container Corporation). The VNRP specifies in-stream total N and P concentrations that should maintain algae levels below nuisance thresholds. These algae thresholds are 100 mg chlorophyll a /square meter for a summer average, and 150 mg chlorophyll a /square meter as a summer maximum. Chlorophyll a is a convenient and generally reliable method to evaluate standing crop of benthic algae. These in-stream targets apply from June 21 to September 21, during the summer growing season.

All of the signatories have made major steps towards reducing their nutrient contributions to the river. For example, since 1999 the Butte-metro sewer plant has been diverting an increasing proportion of its summertime sewer effluent to grow sod, thus reducing its N and P load to the Clark Fork River. To help monitor changes in the river resulting from these efforts, a comprehensive algae and nutrient sampling project was begun in 1998 and will continue for at least ten years.

In November 1999 the Tri-State Water Quality Council raised several issues with the Department including the need to control discharges from non-point source and non-signatory point sources. A major concern of the Tri-State Council was the fact that the permit limits for many of the smaller point sources on the Clark Fork River and tributaries were frequently several times higher than their actual discharges. If they were to discharge at their allowable limits, the net effect would be to negate the cleanup work being done by the VNRP signatories. The Department reviewed this issue and reached a legal conclusion that the VNRP did not set source-specific waste load allocations for these smaller nonsignatory point sources and therefore, there was no legal basis to incorporate effluent limits based upon the in-stream targets into their permits. However, nondegradation requirements and water quality based effluent limits to protect the narrative nutrient standards would be considered during the permit renewal process. Although these requirements have the effect of tightening effluent limits, they aren't necessarily based upon the VNRP in-stream targets.

Although several solutions to the issue were discussed, the Department and the VNRP signatories ultimately agreed that the best approach was to adopt numerical nutrient standards for the Clark Fork River. Numerical standards would require the Department to incorporate effluent limits in the permits for the nonsignatory sources that would meet the standards. It was anticipated that the numerical standards would be identical to the VNRP in-stream targets.

In November 2001, the Department analyzed data that had been collected in the Clark Fork River since 1998. The Department concluded that although total N and P would very likely achieve the intended results, soluble N and P would address the algae problem more directly. In recent years there have been fairly consistent ratios between soluble and total nutrients at sampling stations along the river. Based on these in-stream ratios, the Department's proposed soluble N and P criteria were essentially equivalent to their total-nutrient counterparts in the VNRP. The Department discussed their proposed soluble criteria with the signatories and the Tri-State Council at a meeting on January 31, 2002. There was a good deal of discussion, and ultimately it was concluded that at this time total nutrients are the best type to use in a numerical standard. Therefore the total N, total P, and benthic chlorophyll a values being proposed for adoption are identical to those in the VNRP agreement.

Hearing Information

The Department requests that the Board appoint a hearing officer to conduct a public hearing on 13 May 2002 with the close of public comment on 17 May 2002.

Board Options

The Board may:

1. Authorize the Department to initiate rulemaking and issue the attached Notice of Proposed Amendment of Rules,
2. Modify the Notice of Proposed Amendment of Rules and initiate rulemaking thereafter; or
3. Deny the Department's request that it initiate rulemaking.

DEQ Recommendation

The Department recommends that the Board grant the Department's request to initiate rulemaking and schedule a hearing.

Enclosures

The following information is attached to this summary:

- 1) Draft Notice of Public Hearing on Proposed Adoption and Amendment.